ABSTRACT

A process for the production of hydrocarbons and ammonia, and more particularly a process for optimizing the production of hydrocarbons and ammonia using a combined hydrocarbon synthesis plant and ammonia synthesis plant. Synthesis gas exiting a reforming section of the hydrocarbon synthesis process is sent to a hydrogen extraction unit, where it is divided into a hydrogen-rich stream and a hydrogen-poor stream. The hydrogen-rich stream is then fed into an ammonia synthesis process. The hydrogen-poor stream may be returned to the hydrocarbon synthesis process or may be used as a fuel gas. The process reduces emission of CO_2 into the atmosphere, and requires only one reforming section and one air separation unit for both processes. Removal of hydrogen from the hydrocarbon synthesis process before the synthesis gas enters a Fischer-Tropsch reactor also lowers the H_2/CO ratio of the synthesis gas, therefore resulting in better hydrocarbon selectively.